Marine Life Protection Act Initiative

SAT Evaluations of Northern Channel Island MPAs

DRAFT Presentation to the California Fish and Game Commission

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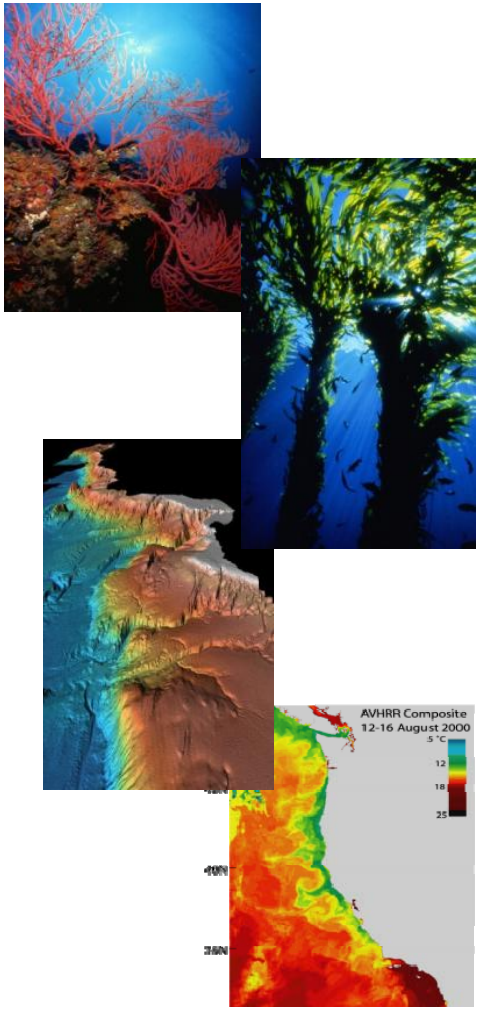
Presented by XXXXXXX

MLPA Goals

1. To protect the natural diversity and function of **marine ecosystems**.
2. To help sustain and restore **marine life populations**.
3. To improve **recreational, educational, and study opportunities** in areas with minimal human disturbance.
4. To protect representative and unique **marine life habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. To ensure that MPAs are designed and managed as **a network**.



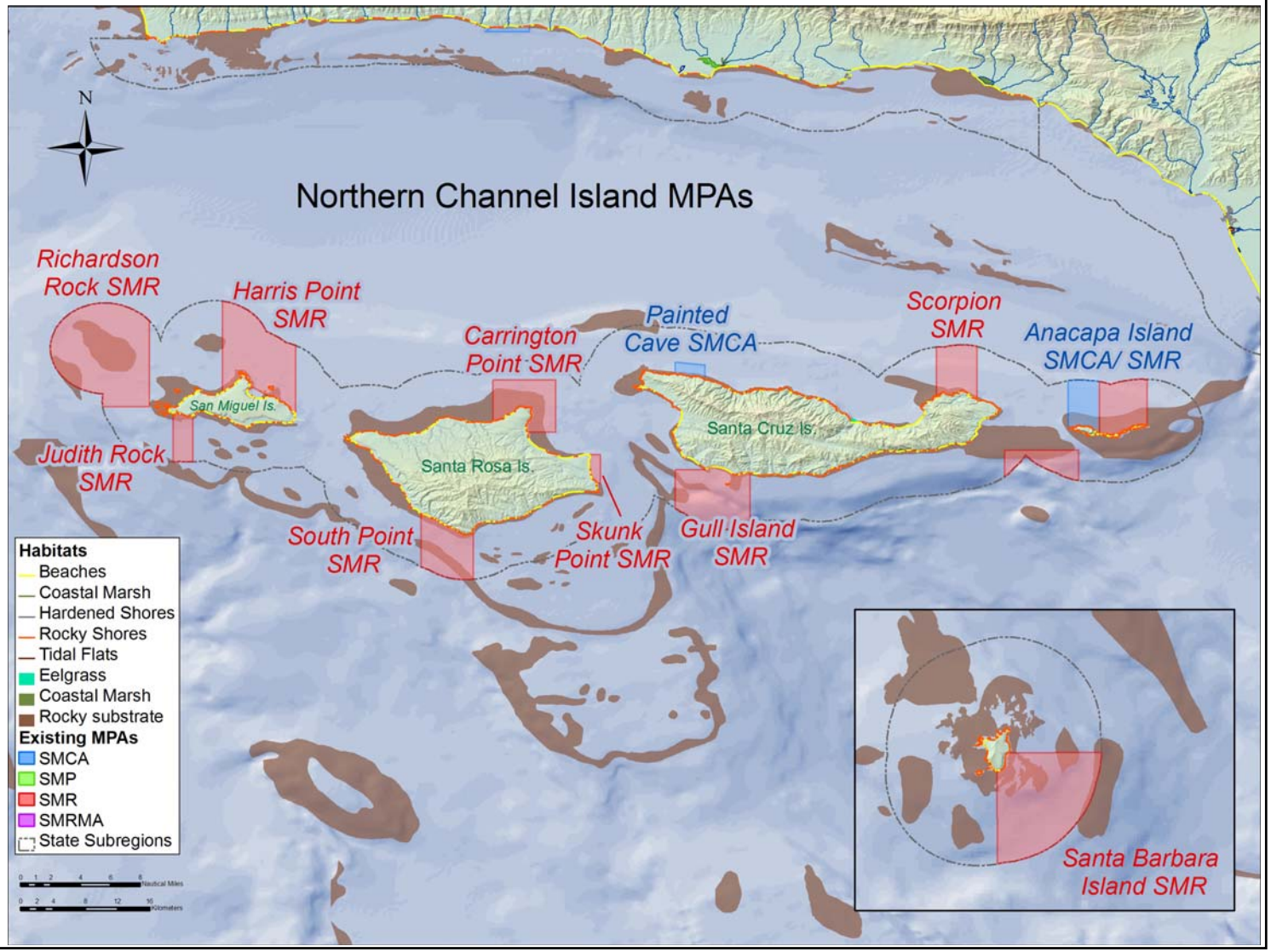
Design Guidelines: Goals 1 and 4

- **Every 'key' marine habitat should be represented in the MPA network –**
  to protect the diversity of species that live in different habitats and those that move among different habitats over their lifetime.

- **'Key' marine habitats should be replicated in multiple MPAs across large environmental and geographic gradients** –
  to protect the diversity of species and communities, and to protect species from local year-to-year fluctuations in larval production and recruitment.

- **At least three to five replicate MPAs should be designed for each habitat type within a biogeographical region** –
  to provide analytical power for management comparisons and to buffer against catastrophic loss of an MPA.

Existing MPAs in the N. Channel Is.



Habitats and Ecosystems

Key Marine Habitats

Seafloor Habitats

- Rocky reefs
- Intertidal zones
- Sandy or soft ocean bottoms
- Underwater pinnacles
- Submarine canyons

Depth Zones

- Intertidal
- Intertidal to 30 m
- 30 to 100 m
- 100 to 200 m
- 200 m and deeper

Biogenic Habitats

- Kelp forests
- Seagrass beds

Oceanographic Habitats

- Upwelling areas
- Freshwater plumes
- Retention zones

Habitats Evaluation (Goals 1 and 4)

Key Questions:

1. How well are key habitat types represented in the existing MPA network?

2. What are the levels of protection for these habitat types?

3. How well are habitats and levels of protection distributed across the study region?

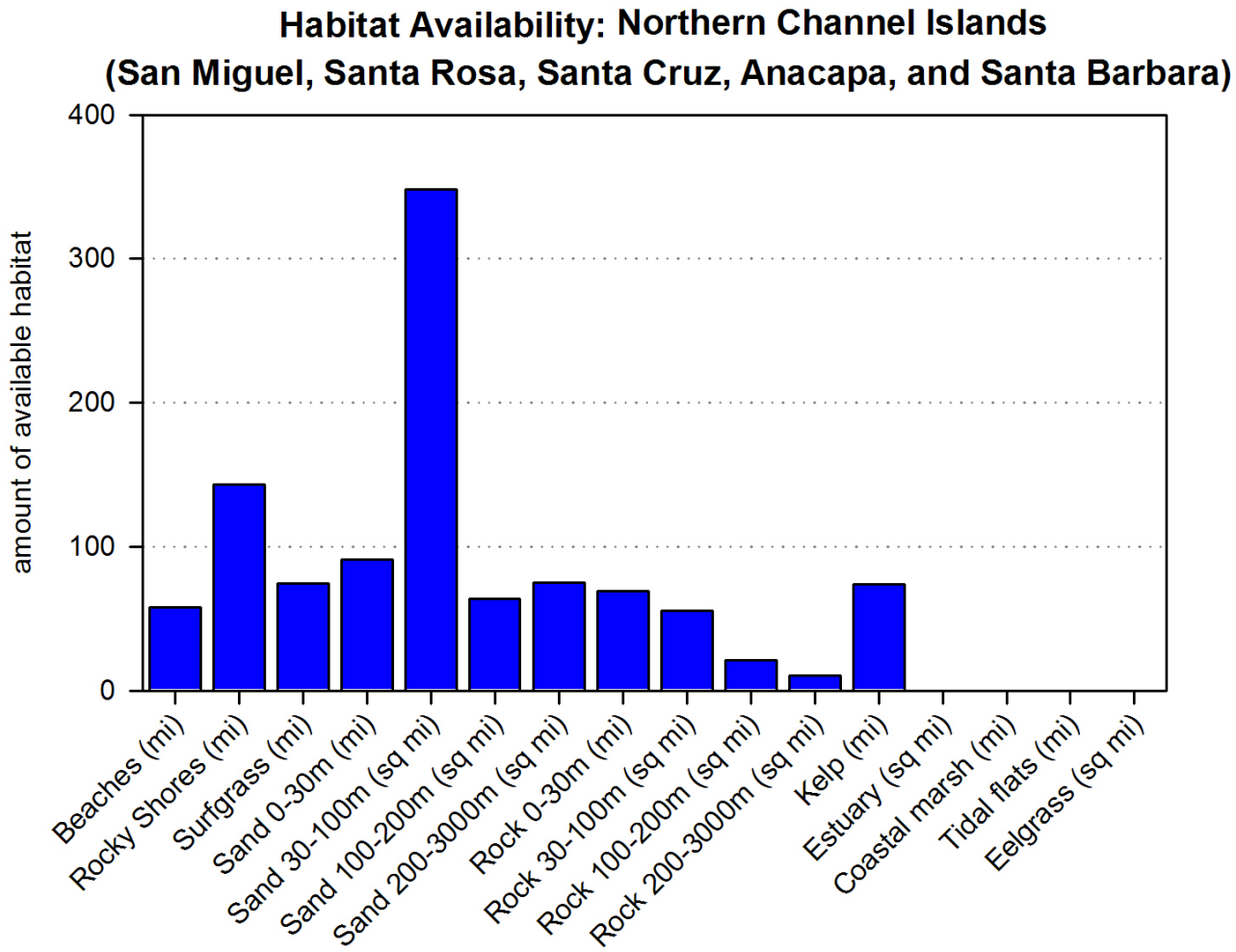
4. How well are habitats and MPAs replicated in the study region?

SAT Guidelines: Levels of Protection

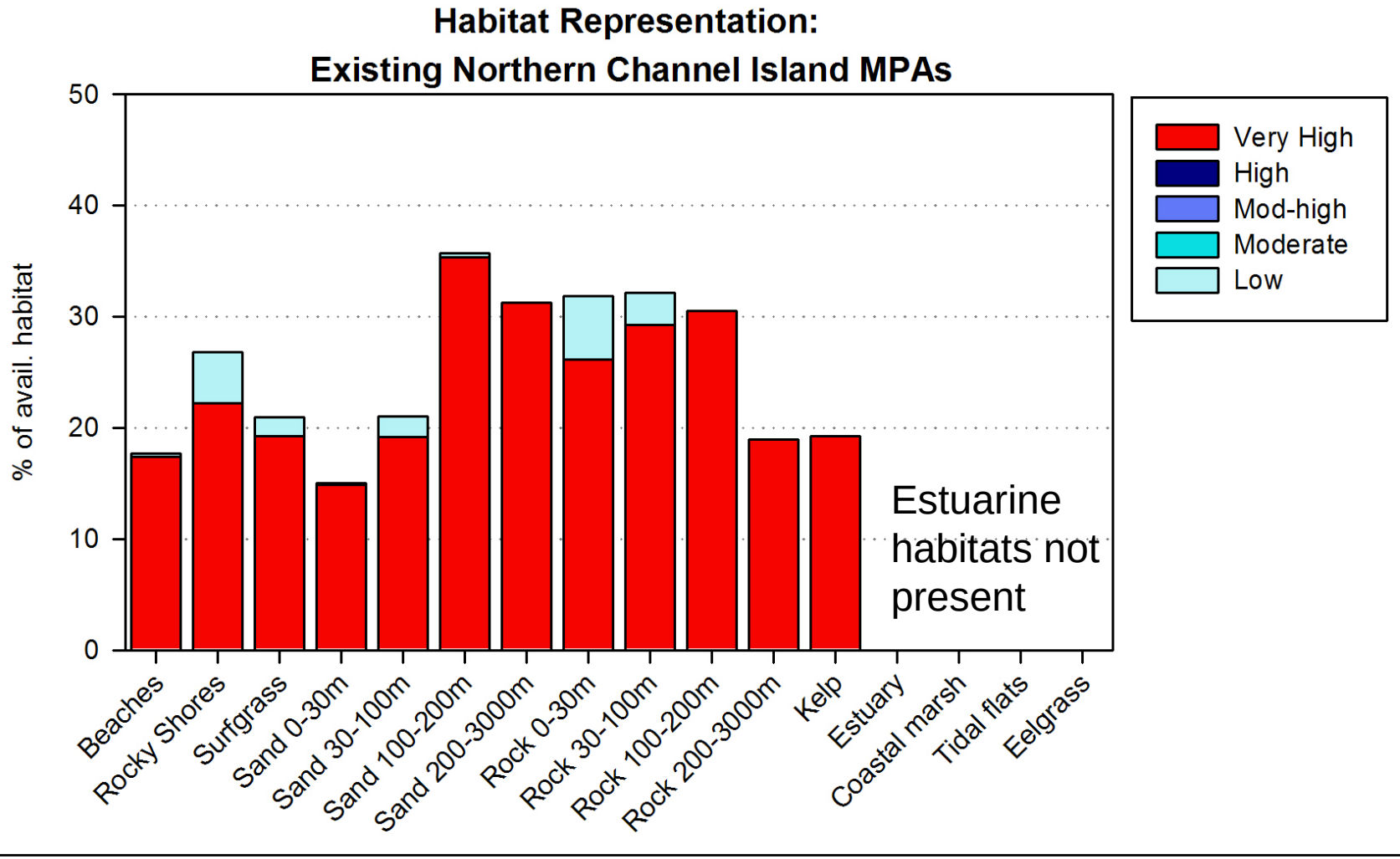
Level of Protection	MPA Types	Activities associated with this protection level
Very high	SMR	**No take**
High	SMCA	**In water depth > 50m: pelagic finfish** (H&L) **salmon by troll only**, **coastal pelagic finfish** (pelagic seine)
Mod-high	SMCA	**Dungeness crab** (traps/pots); **squid** (pelagic seine); **In water depth <50m: pelagic finfish** (H&L) **salmon by troll only**, **coastal pelagic finfish** (pelagic seine);
Moderate	SMCA SMP	**salmon** (non-troll H&L); **abalone** (diving); **halibut, white seabass, striped bass, shore-based finfish, croaker, and flatfishes** (H&L); **smelt** (H&L and hand/dip nets); **clams** (hand harvest); **giant kelp** (hand harvest)
Mod-low	SMCA SMP	**Urchin** (diving); **lingcod, cabezon, greenling, rockfish, and other reef fish** (H&L); **surfperches** (H&L)
Low	SMCA SMP	**bull kelp and mussels** (any method); **all trawling**; **giant kelp** (mechanical harvest); **mariculture** (existing methods in NCCSR)

SMR = state marine reserve SMCA = state marine conservation area SMP = state marine park

Habitat Availability: N. Channel Is.



Representation: N. Channel Islands

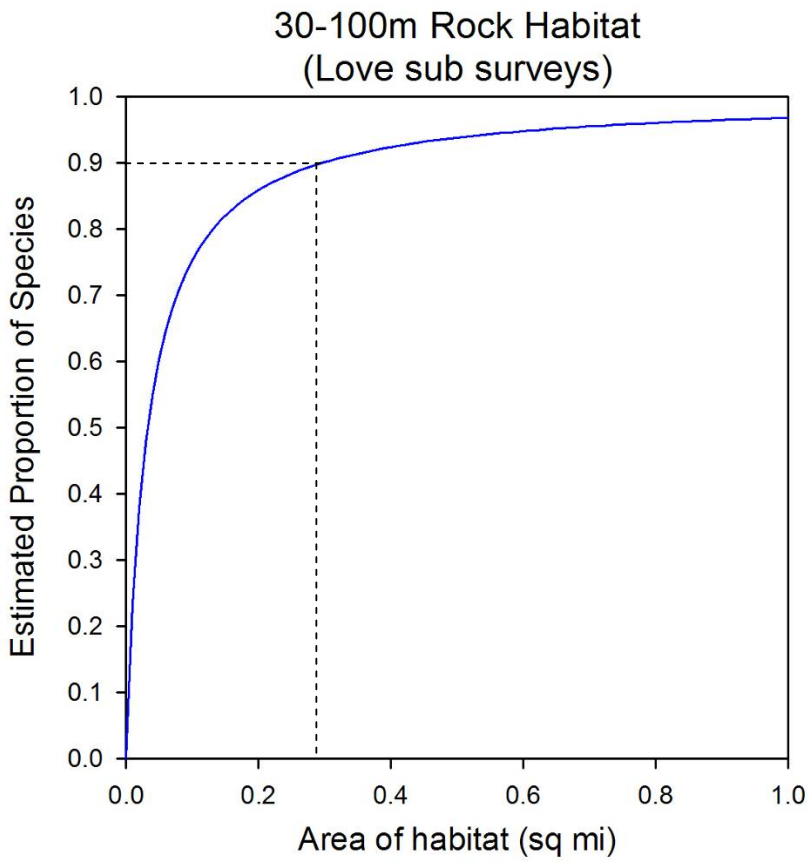


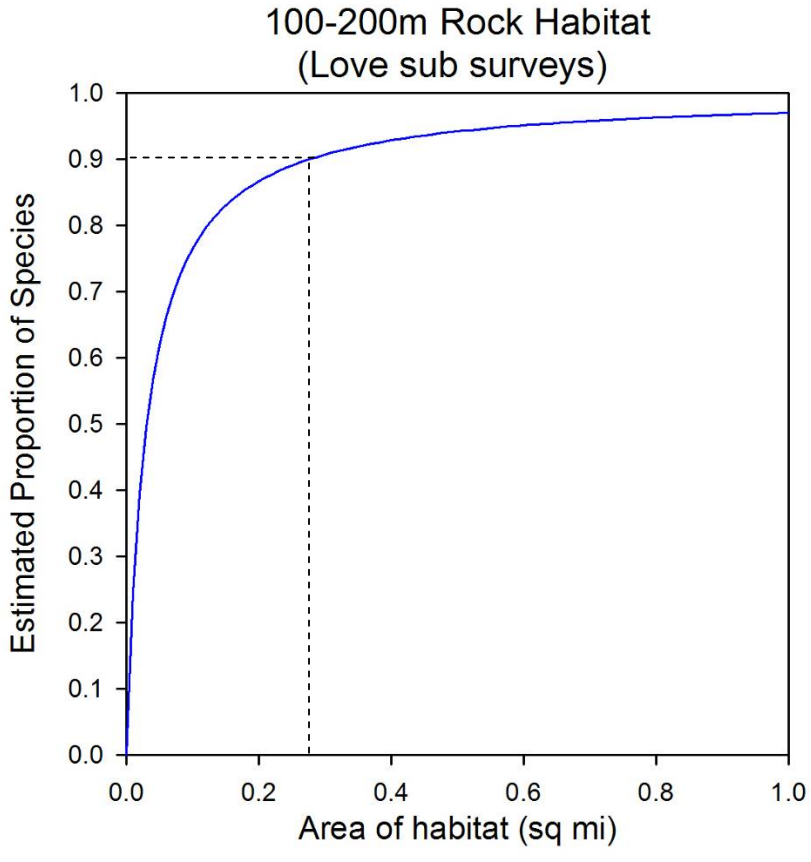
Replication Analysis Methods

To count as a replicate:

- MPA or cluster must meet the minimum size guidelines (9 square miles)
- Habitat must meet the threshold identified to encompass 90% of biodiversity in that habitat type

Replication Analysis Methods



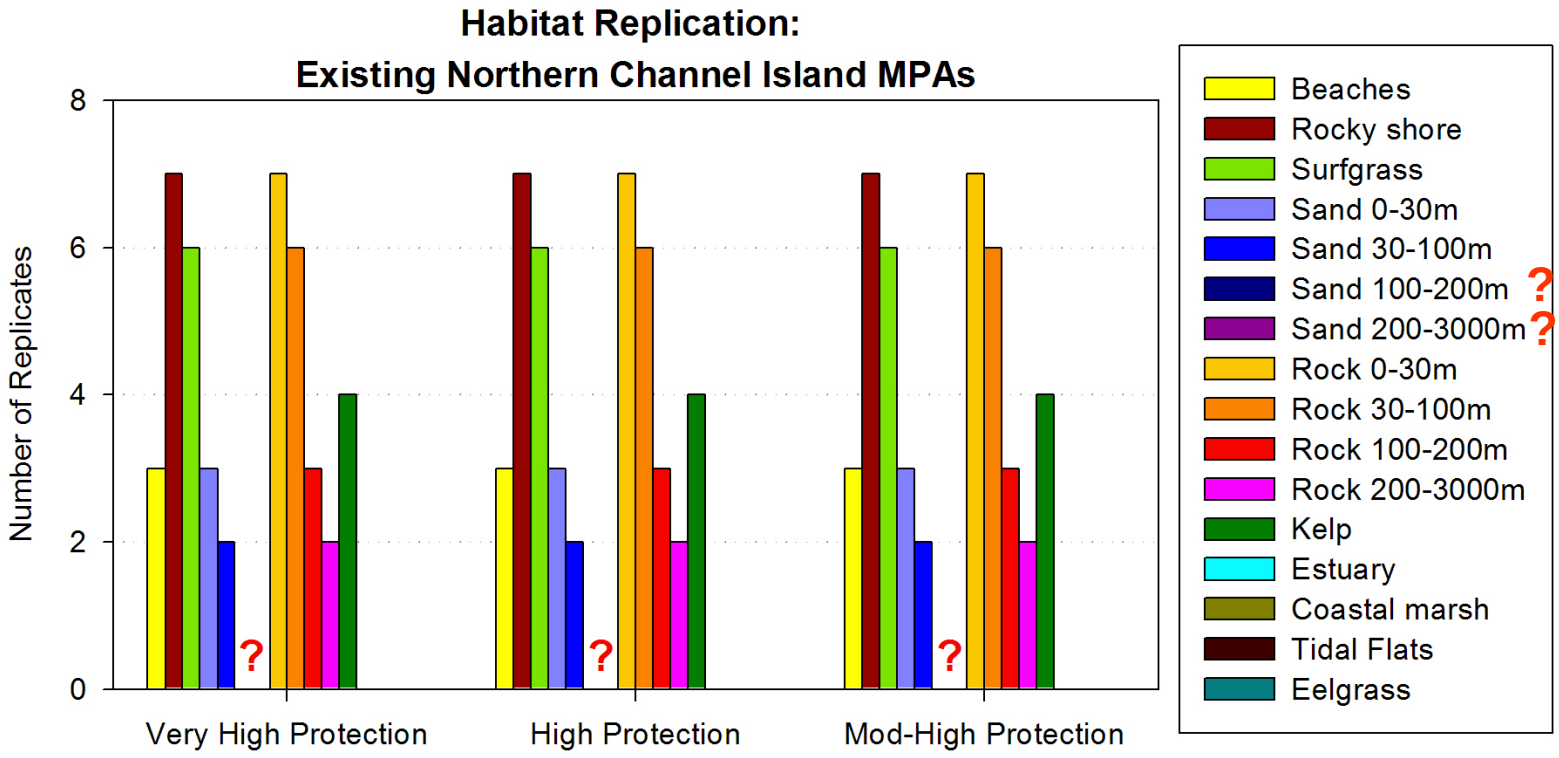


Habitat representation

Habitat	Representation needed to encompass 90% of biodiversity	Data Source
Rocky Intertidal	~0.5 linear miles	PISCO Biodiversity
Shallow Rocky Reefs/Kelp Forests (0-30 M)	~1 linear mile	PISCO Subtidal
30-100m Rocky Reefs	~0.30 square miles	Love surveys
100-200m Rocky Reefs	~0.28 square miles	Love surveys
Sandy Beaches	~1 linear mile	
Sandy Habitat (0-30 M)	~1 linear mile	Based on shallow rocky reefs
Sandy Habitat (30-100 M)	~10 square miles	NMFS triennial trawl surveys 1977-2007
Estuary	~0.12 square miles	SONGS mitigation team surveys

Replication: N. Channel Islands

Estuarine habitats not present in the northern Channel Islands



Representation and Replication

Summary

- 15-35% of all available habitats are included in SMRs
- Most MPAs are very high protection SMRs
- Overall, the existing network of MPAs represent the key habitats across the Northern Channel Islands, thereby meeting the SAT guidelines for representation
- All available habitats (for which replication could be calculated) have at least 2 replicates in SMRs
- Shallower rocky habitats (rocky shore, surfgrass, kelp, 0-30, 30-100, and 100-200m rock) have the greatest replication (4-7)

MLPA Goals: Populations

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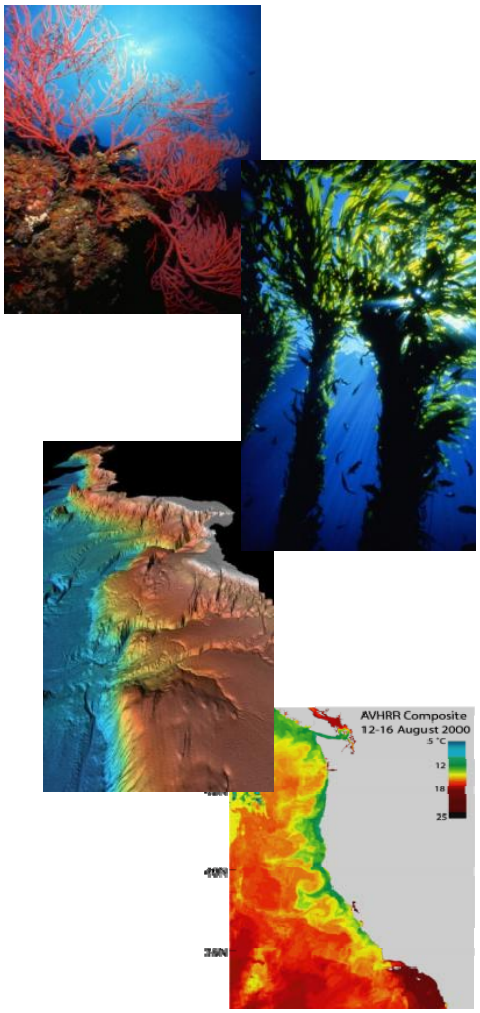


Protecting Populations (Goals 2 & 6)

Size and Spacing

- MPAs should be large enough that **adults** don't move out of them and become vulnerable to fishing

- MPAs should be close enough together that **larvae** can move from one to the next

Design Guidelines: Goals 2 and 6

- **MPAs should have an alongshore span of 5-10 km (3-6 mi) of coastline, and preferably 10-20 km (6-12.5 mi) –**
  to protect adult populations, based on adult neighborhood sizes and movement patterns. Larger MPAs should be required to fully protect marine birds, mammals, and migratory fish.

- **MPAs should extend from the intertidal zone to deep waters offshore –**
  to protect the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats.

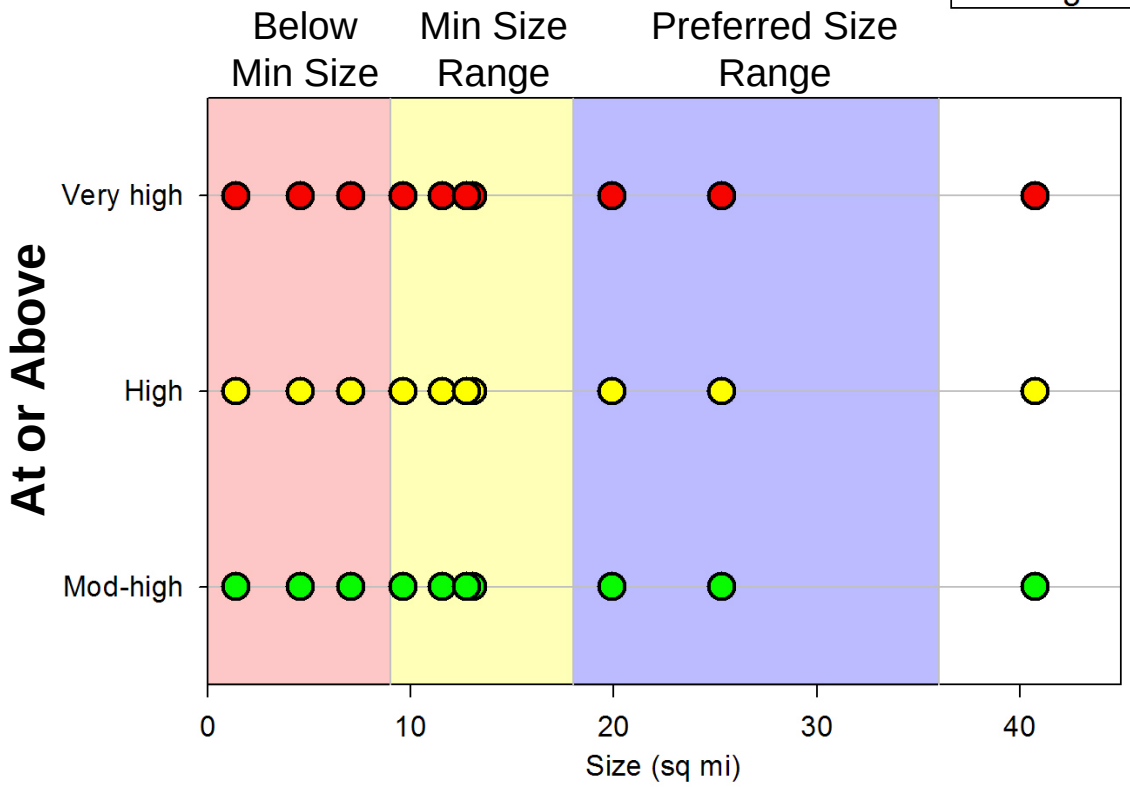
- **MPAs should be placed within 50-100 km (31-62 mi) of each other –**
  to facilitate dispersal and connectedness of important bottomdwelling fish and invertebrate groups among MPAs.

Size Analysis Methods

- Measure individual MPA areas
- Combine contiguous MPAs into MPA clusters
- Consider level of protection
- Tabulate MPA areas relative to minimum & preferred guidelines

Size: Northern Channel Islands

Protection	Below Min Size	Min Size Range	Pref Size Range
Very High	3	5	3
High	3	5	3
Mod-high	3	5	3



11 MPAs are SMRs (i.e. Very High LOP)

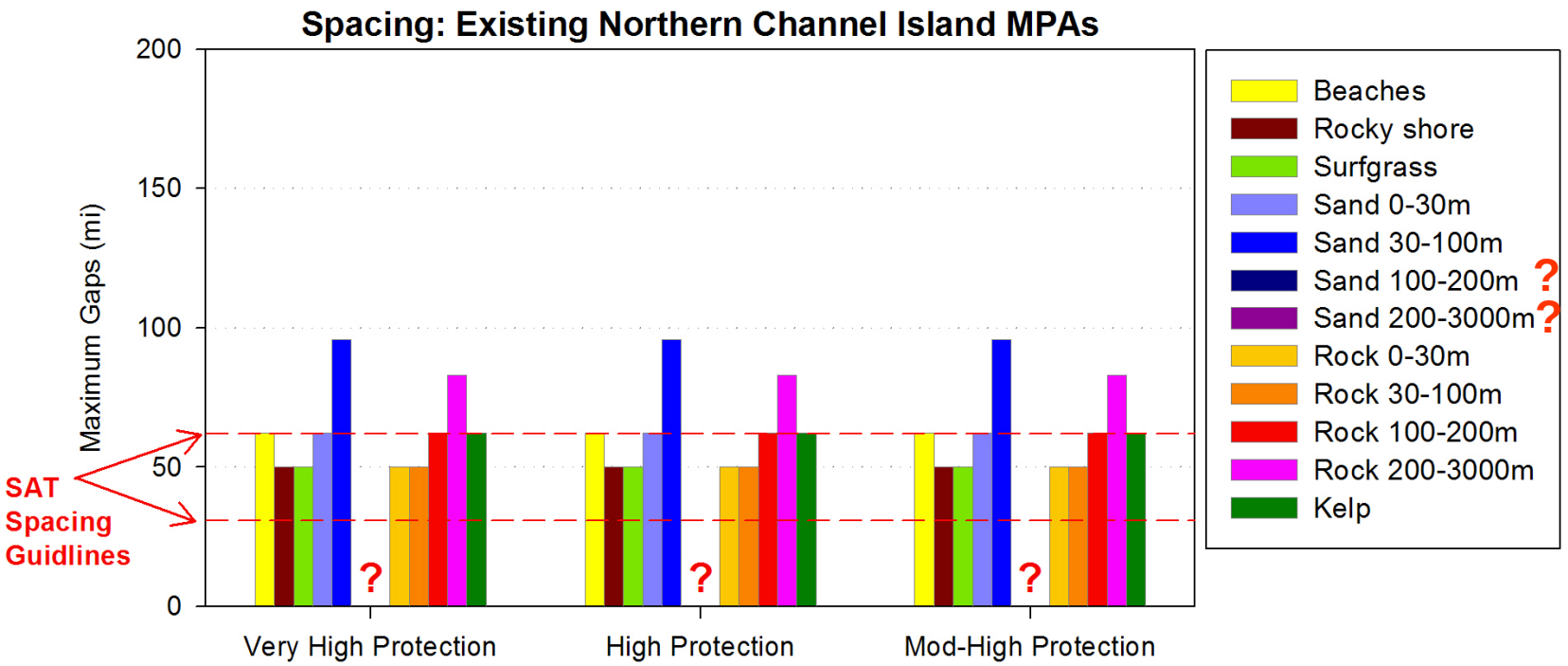
2 SMCAs have Mod-Low protection (don't count)

Spacing Analysis Methods

- MPAs or clusters must meet the minimum size guidelines (9 sq mi) to count for spacing
- Identify the habitats included within each MPA cluster (for soft bottom habitats deeper than 100m this was not possible without more data)
- Measure gaps between adjacent MPA clusters that contain a given habitat

Spacing: Northern Channel Islands

Assumed linear connectivity from Vandenberg SMR to the north and to Santa Barbara SMR in the south



Size and Spacing

Summary

- Most MPAs meet at least the minimum size guidelines
  - ~ 25% of MPAs in the preferred size range
  - ~ 25% of MPAs below the minimum size guideline
- Most available habitats (for which spacing could be calculated) meet the spacing guidelines
- Habitats that do not meet spacing criteria:
  - sand 30-100m (large areas needed to count – gap will likely disappear with addition of mainland MPAs)
  - rock 200-3000m (this habitat has low abundance in state waters)

Information Gaps - Evaluation of SCSR MPAs

- Evaluation does not consider the ecologically-based bioregions
- Only coarse resolution substratum (rock and sand) maps available now (likely over estimates availability of rock substratum)
- Biogenic habitat (surf grass, eelgrass, marsh) maps have inadequacies
- Need to revisit biodiversity-area relationships for regional relevance and for new habitats
- Need to consider oceanographic patterns for connectivity estimates and spacing